

for the presence of fresh littoral shells in 100 fathoms, we require the assistance of waves of sufficiently long period to affect the bottom at that depth, and to this extent theory in the case of ordinary ocean waves will not go.

In a paper submitted last year to the Dublin Society (*Proc.*, vol. iv. p. 241) I recorded observations of waves with an average period of $3\frac{1}{2}$ minutes, and suggested that these waves arose from wind pressure on the surface of the sea; it would be interesting to know at what depth such very long, though irregular, waves would be capable of disturbing light deposits on the sea-bottom. In sheltered localities I have seen these waves attain the height of about three feet; in exposed localities they would doubtless be higher.

ARTHUR R. HUNT

August 15

On the Terminology of the Mathematical Theory of Electricity

IN a letter (*NATURE*, vol. xxxii. p. 76) Mr. W. J. Ibbetson invites suggestions for a convenient abbreviation for "total or resultant pressure"; at the same time he suggests the adoption of "traction" for "intensity of tensile stress." As it seems a pity to employ two totally distinct words to express such closely related ideas as intensity of tensile stress and total tensile stress, I would suggest that, on the analogy of pressure, "tensure" should be introduced for "intensity of tensile stress;" and then, on the analogy of "tension" for "total tensure," "pression" for "total pressure." New words are hard to grow in a language, but in this case pressure and tension might interchange their suffixes as grafts and yield two fresh useful words.

As regards physical and mathematical terminology in general, is not the time ripe for the introduction of a prefix which will modify the meaning of a term as the adjective "negative" does? *Mega* and *micro* have proved useful for multiplying and dividing by a million, but how much greater scope would there be for a prefix "ne" or "neg" for reversing the sign of a quantity. Thus negative electricity might be called "nelectricity," a quantity of negative electricity as so many "necoulombs," a negative magnetic pole as a "nepole," a negative potential as of so many "nevolts," a negative angle could be spoken as of so many "negradians" or "negdegrees," a negative temperature as of so many "nedegrees." In many cases there would be no appreciable advantage, but if there was a general understanding as to the operation of the prefix "ne" in any case, it could be used wherever it would render the phraseology less cumbersome.

Melbourne, July 10

WILLIAM SUTHERLAND

An Encysting "Myzostoma" in Milford Haven

I HAVE recently had occasion to examine a number of *Comatula* from Milford Haven which were kindly given to me by Mr. W. Percy Sladen, F.L.S., and appear to belong to the type that was figured by Miller under the name of *Comatula fimbriata*; and I was surprised to find many of the pinnules presenting distinct traces of an encysting *Myzostoma*. In each of the dozen individuals the joints of one or more pinnules are abnormally developed, and in some cases they form definite cysts, which are, however, much smaller than those found on the pinnules of many *Comatula* and *Peniacrinidae* from the Pacific and Oceania; but they are obviously of the same character and due to the presence of a parasitic *Myzostoma*. According to Prof. L. von Graff eight species of encysting *Myzostoma* are at present known, but they are limited to depths of 120 to 600 fathoms in the Pacific, the Eastern Archipelago, and the Caribbean Sea, with the exception of one which was dredged by the *Hassler* in 35 fathoms off Cape Frio, Brazil.

Mr. Sladen's dredgings at Milford, therefore, have considerably extended both the bathymetrical and the geographical distribution of these encysting species. The five *Comatula* found in the British area have yielded six of the free-living *Myzostomas*, four of which were discovered by the *Porcupine* and *Triton*; and we may probably take it for granted that the encysting form from Milford is another addition to the British fauna.

I propose to send all my material to my friend, Prof. von Graff, for examination; and as there will, no doubt, be much shore-dredging carried on during the next few weeks, I would call the attention of British naturalists to the facts mentioned above, and ask them to look carefully on the pinnules of any *Comatula* which they may find for cysts or other enlargements of the joints.

P. HERBERT CARPENTER

Eton College, August 22

Solid Electrolytes

IN reference to Prof. S. P. Thompson's letter dated August 17 (*NATURE*, vol. xxxii. p. 366), may I be allowed to say that I too have observed the secondary currents which are produced by cells containing sulphides of silver and copper after being disconnected from a battery? I mentioned the fact at the meeting of the Physical Society on June 27, in a communication which will probably be printed in the *Phil. Mag.* next month. Indeed, the observation of these secondary currents preceded and led to the construction of the primary cells with solid electrolytes which I have recently described.

I should be glad to know whether Prof. Thompson can explain the curious effect produced by passing a battery-current for a moment through a cell containing a mixture of sulphide of copper and sulphur between silver electrodes. When the cell is first connected with the galvanometer the usual secondary current appears, but in a few minutes, or even seconds, this current falls to zero and is succeeded by a third, which is in the same direction as the battery-current, and generally continues for some hours.

SHELFORD BIDWELL

August 23

THE SQUARE BAMBOO

THE cylindrical form of the stems of grasses is so universal a feature in the family that the report of the existence in China and Japan of a bamboo with manifestly four-angled stems, has generally been considered a myth, or, at any rate, as founded on some diseased or abnormal condition of a species having stems, when properly developed, circular in section.

Of the existence of such a bamboo there cannot, however, now be any kind of doubt. It is figured in a



Japanese book, the "Sô moku kin yô siû" (Trees and shrubs with ornamental foliage), published at Kyoto in 1829, and the figure is reproduced by Count Castillon in the *Revue Horticole* (1876, p. 32).¹ It is further figured in a work for a copy of which we are indebted to my friend Prof. Kinch (formerly of Tokiyo), called the "Ju-moku Shiri-yaku"—i.e. a short description of trees (of Japan). Finally, in 1880, Messrs. Veitch presented to the Kew Museum fine specimens of the stem of the square bamboo,

¹ The woodcut also appeared in the *Gardeners' Chronicle* for January 29, 1876, p. 147. I am indebted to the Editor for its use on the present occasion

brought from Japan by their intelligent collector Mr. C. Maries.

M. Carrière states, in an editorial note to Count Castillon's article, that the plant had been introduced into France at that date, and was indeed actually on sale in the nurseries near Antibes.

Nothing, however, till quite recently, appears to have been known as to the existence of the square bamboo in China, from which country, however, it is extremely probable that the Japanese procured it. Thus, Mr. F. B. Forbes, whose personal knowledge of the Chinese flora is only second, perhaps, to that of Dr. Hance, informs me:—"I have never seen the square bamboo growing, and I have always supposed that its 'squarity' was artificially produced."

The first authentic account of its occurrence in China is, as far as I know, due to Mr. Frederick S. A. Bourne, of H.B.M. Chinese Consular Service. Mr. Bourne wrote to us, October 15, 1882, that he had made a journey from Foochow to a distance of 300 miles to the western border of the Fokien province, reaching Wu-i-kung, the celebrated monastery in the Bohea hills—a place, Mr. Bourne states, "only visited by a European once before, I believe—i.e. by Mr. Fortune, about the year 1845." In the gardens of this monastery he found several clumps of the square bamboo growing to the height of about eight feet.

The *Tropical Agriculturist* (an astonishing repertory of everything relating to the economic botany of the East) contains in its issue for November, 1882 (p. 445), an article extracted from the *North China Herald*, also relating to the square bamboo, plants of which, destined for the park at San Francisco, had been obtained by Dr. Macgowan at Wenchow. I extract from this article the following particulars, which show the interest the Chinese themselves attach to the plant:—

"Pre-eminence is assigned to the square variety of this most useful as well as ornamental plant, which has been a favourite in Imperial gardens whenever its acclimatisation has been effected in the north. The Emperor Kao Tsu once inquired of his attendants, who were planting bamboos, concerning the various kinds. In reply he was informed concerning several remarkable species. Chekiang in particular furnished one that was an extraordinary curiosity, in that it was square, and for that quality and its perfect uprightness was much esteemed by officers and scholars. They also told him that it was used for many purposes of decoration and utility, including, among others, that of being made into ink-slabs. Subsequently specimens were obtained, polished, and sent to his majesty, who thereon signified his respect for the article by rubbing ink with his own hand on the inkstand, and inditing an essay on the curiosity. In 650 A.D. the reigning Emperor sent a eunuch to Chekiang to obtain specimens for the Imperial Park. Besides being furnished from scattered portions of this province, it is found in Honan, Szechuen, Yunnan and Hunan; in the latter province it appears to present its peculiar characteristic in a marked degree, being as square, with corners, and as well defined as if cut with a knife. The Chekiang varieties have slightly rounded corners, and moreover they are more slender, being used only as pipe-stems, whereas the western kind is large enough to serve as staves for the aged. In its early stage of growth the square bamboo is nearly round, assuming the anomalous figure it afterwards presents as it advances towards maturity. Like several other kinds of bamboo it is thorny, abounding in small spines."

Dr. Macgowan being well known to botanists for his intelligent interest in all that relates to the vegetable productions of China, I ventured to write to him to ask his aid in procuring living specimens of this interesting plant for the Royal Gardens. Through his kindness and that of Mr. E. H. Parker, late acting consul at Wenchow, we

were fortunate enough to receive a Wardian case filled with plants of the square bamboo, some of which at least appeared to be alive and likely to grow. Besides these Dr. Macgowan sent us specimens of walking-sticks and pipe-stems made from it.

I quote the following passages from the very interesting communication with which Dr. Macgowan was also good enough to favour us:—

"Its geographical range is from 25° to 30° N. latitude, littoral, and westward farther than I have been able to discover. Unlike other varieties of bamboo here, its shoots are developed in the autumn, not in the spring. It sprouts in September or October, and the stems grow until they are arrested by December cold, by which time they attain a height of from two to four or five feet. In the spring following their growth recommences, when the grass attains its full height, ten to fourteen feet. The lower portion of the culms bristle with short spines; in the second or third year their squareness is far less striking than when matured by several years' growth; that quality is sometimes so marked that a native botanist describes them as appearing like rods pared by cutting instruments. I have seldom found the corners much more sharply defined than in the largest of the specimens herewith transmitted. It is cultivated chiefly for ornament in gardens, in temple courts, &c.; the larger stems (sometimes as much as an inch and a half through) are used for staves; the smaller and less squarish for stems of opium-pipes; and the smallest and less mature for tobacco-pipes."

He further adds:—"Its anomalousness is attributed by the Chinese to supernatural powers—occult agencies varying with each district. The *Ningpo Gazetteer* tells how Ko Hung, the most famous of alchemists (fourth century A.D.), thrust his chopsticks (slender bamboo rods pared square) into the ground of the spiritual monastery near that city, which, by thaumaturgical art, he caused to take root and to appear as a new variety of bamboo—square."

As no flowering specimens of the square bamboo have reached the hands of botanists, its taxonomic position must at present be regarded as doubtful. Rivière ("Les Bambous," p. 315) refers to it as the *Bambou carré*, and Fenzl, quoting from Rivière (*Bull. Soc. Tosc. di Ort.*, 1880, p. 401), gives it the name *Bambusa quadrangularis*.

I can discover no reference to it in the late General Munro's classical monograph of the *Bambusaceæ* (*Trans. Lin. Soc.*, vol. xxvi.). Of the three groups into which he divides the genera, in only one, *Triglossa*, is there any tendency to depart from the habit of the order in having anything but round stems; and this only occurs in the small genus *Phyllostachys*, in which they are somewhat laterally flattened. The stems of *Phyllostachys nigra* are often used in Europe for walking-sticks and light broom-handles.

But I do not think the square bamboo will turn out to be a *Phyllostachys*. Munro has a *Bambusa angulata* which is distinguished from all its allies by having the branches of the panicle angular. This is the only tendency to angularity of stem which I have discovered among the true *Bambuseæ*.

For the present, at any rate, the species must be known provisionally as *Bambusa quadrangularis*, Fenzl.

W. T. THISELTON DYER

FORECASTING BY MEANS OF WEATHER CHARTS

THE Meteorological Office has issued a work on the "Principles of Forecasting by Means of Weather Charts," which has been prepared at the request of the Council by the Hon. Ralph Abercromby.¹ The object of

¹ "Principles of Forecasting by Means of Weather Charts." By the Hon. Ralph Abercromby, F.R.Met.Soc. Issued by the Authority of the Meteorological Council. Official No. 60. 8vo. Pp. 123 + viii. London: 1885.